

National Aeronautics and Space Administration

Office of Biological and Physical Research

**BIOLOGICAL AND PHYSICAL RESEARCH  
ADVISORY COMMITTEE**

November 29, 2001

Washington, DC

**TELECON MINUTES**

*Bradley Carpenter*

Bradley Carpenter  
Executive Secretary

*Kenneth M. Baldwin*

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Chair

Attendees via Telephone:

Dr. Kenneth Baldwin  
Dr. Raymond Bula  
Dr. Thomas Daley  
Dr. J. Milburn Jessup  
Dr. Alexander McPherson  
Dr. Mary Musgrave  
Ms. Elsa Porter  
Dr. David Ryugo  
Dr. Jay Sanders  
Dr. Kathie Olsen

Press:

Nature- Tony Reickhart

Attendees at NASA Headquarters:

Dr. David Liskowski  
Ms. Kristen Erickson  
Mr. Chris Flaherty  
Mr. Peter Ahlf  
Dr. Gene Trinh  
Dr. Brad Carpenter  
Mr. Mark Uhran  
Ms. Candace Livingston  
Mr. Corky Clinton  
Dr. Guy Fogelman  
Ms. Joan Zimmermann (minutes)

Chris Flaherty opened the conference by referring to documents supporting the GPRA Performance Assessment (FY 2001 Performance Report Index: Biological and Physical Research Enterprise Narrative). Referring to documents sent to BPRAC members prior to the teleconference, he introduced the intention of reviewing the documents goal by goal. The intention was to obtain answers to questions online or submit more information to the committee if necessary.

Annual Performance Goal 1H1: Complete testing and delivery for spacecraft integration of experiments for the Mars Surveyor Program 2001 orbiter and lander missions.

BPRE successfully completed testing and delivery of a radiation monitoring experiment. The lander mission was cancelled. Instruments in this program were developed, however, they were not tested and delivered to spacecraft, which accounts for the assessment code of yellow.

MARIE and MECA did not fly. Tom Daley commented that he interpreted the goal as green. A comment from a BPRAC member regarding the nonsequential numbering of the performance goals was made. The question: "How many of these items are there supposed to be and how pertinent to OBPR? What is the reach of this program- shouldn't there be a definition within these performance goals?" Mr. Flaherty replied that these goals were written at a time when BPRE was part of the HEDS enterprise. For 1H1, the third indicator (complete testing and delivery of MIP) falls under code M. Code B must integrate responses. Code B regards this situation as having no spacecraft to deliver to. Code B wants to characterize this performance goal as red. However, the instruments were completed and put it into bonded storage and may be flown on future missions. Comment from BPRAC: for code U, this performance goal should be considered green. A suggestion was made to characterize the goal as green but overall yellow. Mr. Flaherty concurred with this assessment. Dr. Kenneth Baldwin supported the comment that Code U objectives had been met, although he noted that the standards were open to interpretation and there may yet be controversy over the matter.

Annual Performance Goal 1H3: Expand Scientific Knowledge.

The process of collecting reports from principal investigators (PIs) is currently under way, therefore the goal is unreviewed at this time. The goal of 1500 journal articles is based on historical performance; the ratio is roughly one PI- 1.2 publications. The purpose is to emphasize to external audiences that BPRE publishes results in peer-reviewed journals- no action required on this item.

Annual Performance Goal 1H4: conduct peer-reviewed and commercial research on STS-107.

The performance goal is red as STS-107 did not fly. The goal was corrected by Code B to yellow; this is decoded to mean that the goal was not achieved in the intended fiscal year, but is expected to be achieved in the near future. A question was raised about the significance of Code B. The response was that Code B represents the office of Chief Financial Officer- responsible for routing subcommittee report to Congress. Code B works with the Office of Management and Budget to get approval on report). A comment was made to the effect that STS-107 may never fly, therefore why does it merit an assessment? Dr. Flaherty replied that all goals will probably be assessed, regardless of the uncontrollable budget pressures surrounding the program. Last year, code M suggested the performance assessment be termed white because they were

unprepared for assessment. Dr. Baldwin commented that code U has been trying to fulfill its responsibility and that goals keep slipping for reasons beyond their control. A BPRAC member commented that this goal is so ephemeral and difficult to assess that an assessment of white may be a good idea. A motion made and seconded to change the assessment from yellow to white, with white representing a goal that is not assessable or applicable.

Annual Performance Goal 1H5: Continue initial research on the ISS by conducting 6 to 10 investigations. The microgravity experiments concerning colloidal self-assembly successfully returned data. An additional indicator was the acquisition of acceleration environment measurement data; the assessment is an overall green target.

Annual Performance Goal 1H17: develop new biomedical and technological capabilities to facilitate living and working in space and return to Earth.

Included in this goal was a flight countermeasure to reduce kidney stone risk. This performance goal was assessed as green. A BPRAC member concurred with the green assessment and asked if indicators changed from year to year, citing the kidney stone risk indicator as not terribly broad in scope. Dr. Flaherty replied that indicators will change from year to year, although goals may persist. Dr. Daley asked if acoustics could be added as a briefing topic for the next meeting. Dr. Fogelman suggested the topic be discussed at an upcoming (LSAS?) subcommittee meeting. There was general agreement with this suggestion. Another question was raised about low-frequency noise and the possibility that it could impart natural energy. A comment was made that this topic should be noted and forwarded to the Executive Secretary.

Annual Performance Goal 1H18: Demonstrate, in ground test, at least one technology that could reduce up to 25% of life support logistics over ISS baseline and release report of progress for review on the Internet. Dr. Flaherty describes this indicator involves a detailed calculation developed by Dr. Fogelman; the process looks at overall Advanced Life Support system mass and aims to reduce it by a factor of three by 2010. The details of the calculation are on the Internet for the purpose of inviting comment. Dr. Musgrave asked if this metric signifies that the technology is moving closer to a limit? Dr. Fogelman replied that the investigators look at each ratio, normalized to a particular mission. The goal is to determine what can be accomplished without violating physical laws. A question was raised: does the metric reflect implementation? Dr. Fogelman replied that the metric included ducting and structural components; numerators and denominators of the metric are assessed similarly

Annual Performance Goal 1H31: Initiate Bioastronautics Initiative; NASA/NCI collaboration. Dr. Flaherty described this activity as in work via joint solicitation. Dr. Fogelman added that these goals were set two years ago; IH31 does not refer to the newer announcement made in October 2001.

Annual Performance Goal 1H22: Expand commercial development of space.

Dr. Flaherty commented that it takes some time to count 20 new industrial partners. The goal is a candidate for blue, but has been conservatively designated as green. A BPRAC member motioned that the goal be deemed blue; the motion seconded and approved.

Annual Performance Goal 1H23: Foster commercial endeavors.

A BPRAC member commented that this is an important achievement; all members were in favor of a green score.

Annual Performance Goal 1H26: Support participation in HEDS research.

Based on CDs and publications handed out, Dr. Flaherty scored this goal a green. A BPRAC member commented that all were in favor to call it green and added that the new format was a big improvement over what had been experienced in the past. A BPRAC member asked if the new presentation format (separate narrative and metrics reporting) had come through the NAC. Dr. Flaherty replied that recommendations had been obtained from the BPRAC and the NAC, after complaints had been aired concerning inadequate or uncertain data. A question was raised about other indicators outside of HEDS. Dr. Flaherty replied that there were Mars exploration indicators and an entire set of HEDS goals concerning the space station. Others are OBPR indicators. There is some overlap, such as with the exploration performance goal. In addition, ISS experiments can get carried in both places. In education, the same performance goal is shared. However, the student competition and the goal to complete a customer engagement plan are not part of code U.

Dr. Flaherty stated that OBPR is to now an independent enterprise, the BPRE; in future years, our performance metrics will not be part of the HEDS enterprise. This is a transition year. HEDS indicators will disappear and BPRE indicators will be developed. There is also a timing aspect; planning for 2002 is already complete. BPRAC reviewed FY2003 material in May 2001, at which point there was significant criticism. A long-standing comment from BPRAC was that it had not been consulted when OBPR/BPRE was constructing performance plans for 2003. This is an agency product so OBPR/BPRE is not 100% free to respond to BPRAC. A BPRAC member asked if there would be a chance to review 2003 targets. A BPRAC member stated that BPRE has trend data that states the division met certain goals. Dr. Flaherty stated that he felt raw reporting of percentage goals is not very informative. A BPRAC member commented that it would be useful to account for the missing percentages and the reasons behind them.

Dr. Ray Bula inquired that in view of the ISS budget status (code M to U transfer), will there be a performance goal for construction of the ISS facilities? Dr. Flaherty replied that there will be a performance goal but that it would be hard to write so far in advance of the completion of the respective facilities. Dr. Bula commented that the committee and NASA should look at how such performance goals will be accomplished using available funds. Dr. Flaherty responded that NASA has a nonspecific placeholder targets based on planned facility development schedules.

#### IMCE report/ ISS research status

Ms. Kristen Erickson reported on the upcoming response to the IMCE report, also known as the Tom Young report. The IMCE report was delivered to the NASA Advisory Council on November 6th. The time period to allow to deliberation and comment was announced on the NASA website; this period is to end on November 30. The website acts a forum to solicit public comments. Announcements will be made on December 5 and 6. At that point NASA will have officially received the report along with the NAC findings. Dr. Kathie Olsen, NASA Chief Scientist, Office of the Administrator, stated that Drs. Mulville and Olsen will be traveling to Johnson Space Center to assess the NASA response to the IMCE report. NASA will ask BPRAC for "science" input, along with feedback from Dr. McElroy. A BPRAC member commented that

he had attended a recent Space Studies Board meeting, and had come away with the impression that NASA would concur with the report's findings.

Dr. Olsen commented that she intends to develop a strategic plan for OBPR and take up recommendations from the October meeting. She stated she would like to have BPRAC and NRC members participate in the planning meeting in early 2002 when OBPR begins the prioritization process. Dr. Olsen commented that Earth Science and Space Science have excellent strategic plans, and their strategies would be useful templates to help plan the (ISS) budget. A BPRAC member commented that he was surprised the IMCE report did not mention the commercial potential of ISS and asked if this issue could be brought out. Another member commented that he could not account for this omission. In BPRAC recommendations, the committee did acknowledge synergy between entities in code U, including commercial concerns. He suggested that this topic be elaborated upon, and brought to the fore in order to assess the NAC's response. Dr. Olsen stated that she will be sensitive to this situation and such concerns would be included in the language of the reply to the Tom Young report.

Dr. Jessup commented that he was disturbed by an IMCE statement regarding research priorities. The report stated that the current highest priority is long-term space flight- he felt that there were other priorities and that the recommendation should be rephrased- i.e., that space flight should not be accepted as highest priority. A NASA member commented that in a time of dwindling budgets, priorities will have to be developed. The IMCE report is adamant about making the exploration orientation primary.

Dr. Jessup commented that the other function of NASA is to use the unique attributes of space for those who will never go into space- there needs to be a quasi-public buy-in (to ensure support of ISS). A BPRAC member commented that the exploration orientation had its origins before the Young report was issued; the prevailing attitude was that there were going to be cost overruns and that science was going to take a hit. The posture was set within the NAC and Tom Young, as the chair of the task force, took the issue and ran with it. The Space Studies Board is also exploration-oriented. Perhaps this concern should be included in web pages where comments are being solicited. Dr. Bula stated that he would state his objection to the exploration priority in this forum. Dr. Olsen added that Earth and Space Science do not term their priorities in superlative form; several goals can given equal weight as top priorities.

#### Status of ISS research program- FY2002-

Dr. Brad Carpenter summarized relevant extracts from the appropriations committee hearings that were to be sent to be BPRAC, including information on the \$55 M plus-up (Information Pack-14 page draft)

Ms. Erickson suggested to Dr. Bula that he send comments to Phil Cleary, the new Executive Secretary of NAC (now code IH at NASA).

#### Status of FY 2002 ISS budget

Dr. Olsen announced that the FY02 ISS budget was signed into law by the president over the weekend. She stated that every earmark was covered with additional money, and that the budget included more appropriate language concerning how each earmark needs to go through the

proper channels in order to be carried out. For example, proposals must be written to enable allow earmarks to proceed.

Ms. Erickson stated that overall, the agency's earmarks doubled to \$500M, however, NASA got the transfer back into the ISS research capability budget-transferred in at about \$175M less than last year. However, Congress gave NASA an additional \$55M in that account. NASA had given them a list of basic research capabilities- including habitats and combustion science racks.

NASA will be allocating this \$55M across two divisions-

\$20M: Fundamental Space Biology

\$35 M: Physical Sciences

Dr. Baldwin asked if these allocations were consistent with the Congressional mandate.

Ms. Erickson replied that this was so. She further stated that NASA needs to comment on the TY report and then reset future funding requests accordingly. NASA is trying to fund basic capabilities to preserve options in case research priorities change.

A BPRAC member stated that IMCE identified the Centrifuge and CAM as top priorities.

Ms. Erickson replied that these goals were covered in the FSB- \$4M was also transferred to fund 4 commercial space centers previously managed by TODR- these centers are finally under OBPR purview. That was a victory. The information pack contains numbers that are still changing, reiterating that it is a draft. Ms. Erickson asked BPRAC to review it at leisure. Ms. Erickson stated that OBPR is now developing a 2002 Operating Plan to send back to Congress. The plan is not yet finalized by NASA.

STS-107- the latest date for launch is July 2002. There is cost growth due to delay mostly due to the Spacehab workforce that needs to be kept intact. The Agency will still have to absorb this cost and needs to work with the Comptroller on the issue. Approximately \$13M must be absorbed across OBPR budget. The Spacehab workforce is costing \$2M to \$2.5M per month. A BPRAC member raised a question about the Buy-back priority Rationale plan. The cell culture unit is the only item in this plan- will this will enable CAM to be continued? Ms. Erickson replied that CAM is the barter; CAM is enabled by funding research capabilities that will use the CAM. CAM itself is being borne by NASDA. A BPRAC member asked who bore the cost for integration and location of CAM. Ms. Erickson replied that OBPR bears the cost and has arranged for it in outyear planning.

A BPRAC member commented that there is concern for support of the animal habitats that are to be used in the Centrifuge- 60% reductions in funding were being discussed at one point. Are the 2002 dollars going to address this concern? 2006 is the goal year.

Dr. David Liskowski replied that the cell culture unit will be fully funded, and additional funds are to be used for plant and animal habitats, phased in for the delivery of Centrifuge. OBPR is looking at how to do this in the most cost-efficient manner.

Dr. Baldwin commented that if NASA doesn't have a mechanism for this, it will have another white elephant- it needs to support the presence of humans in space. How can NASA jibe this with the IMCE report finding? Dr. Liskowski responded that the question is how NASA can get there- it can complete CCU and is looking at a number of options for funding the plant and rodent habitat, including international partner and commercial options. Dr. Bula reiterated that there is a pressing need for an advanced animal habitat, and plants are already flying on ISS. A BPRAC member commented that ST-S108-uses shuttle animal enclosure modules. Dr. Liskowski commented that the driver is the science and not hardware. Dr. Musgrave commented that it is

wise to keep in mind the capability of plant researchers, there may not a good match between what different researchers are capable of. Dr. Baldwin asked if these issues were part of the strategic plan. Ms. Erickson replied: Yes and no. We have begun a bottoms-up assessment of the 2002 budget to revalidate science priorities.

#### 2002-2003 calendar

The NAC meets from February 28-March 1. Dr. Carpenter mentioned that the NAC website is down right now and that this information comes from Phil Cleary.

Dr. Baldwin agreed that February 19 and 20 are good days for a BPRAC meeting in DC. No subcommittee meeting is associated with this period.

Dr. Carpenter recommended June 19-21 for a second meeting, with a subcommittee on the 19<sup>th</sup>, and BPRAC on 20 and 21. Plan for a day-and-a-half meeting.

October: World Space Conference (11-19) may warrant a meeting in Houston.

A BPRAC member suggested that June planning be taken up in February, and perhaps have an email circulated at that time.